



Docket No.: M4065.0724/P724
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Kristy A. Campbell

Application No.: 10/622,482

Group Art Unit: N/A

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Examiner: Not Yet Assigned

For: IMPROVED PERFORMANCE PCRAM
CELL

INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
Washington, DC 20231

Dear Sir:

Pursuant to 37 C.F.R. § 1.56, the attention of the Patent and Trademark Office is hereby directed to the documents listed on the attached PTO/SB/08. It is respectfully requested that the subject matter of the documents be expressly considered during the prosecution of this application and that the documents be made of record therein and appear among the "References Cited" on any patent to issue from this application. A copy of each document is attached.

This Information Disclosure Statement is filed before the mailing date of a first Office Action on the merits as far as is known to the undersigned.

A brief explanation of relevance of the non-(U.S.)-patent documents listed on form PTO/SB/08 is provided and attached hereto as Appendix A. The brief explanation provided for each document is not tantamount to an admission that a document is "material" or that it qualifies as prior art. The Examiner is respectfully requested to utilize

Appendix A only as a tool by which to better categorize the documents for substantive use in examining the claims of the application.

Documents discussed in Appendix A marked with an asterisk (*) are indicated to be potentially more relevant than others. Such marking is provided only to assist the Examiner; however, the Examiner is requested to thoroughly review all documents cited herein.

In accordance with 37 C.F.R. § 1.97(g), the filing of this Information Disclosure Statement shall not be construed to mean that a search has been made or that no other material information as defined in 37 C.F.R. § 1.56(a) exists. It is submitted that the Information Disclosure Statement is in compliance with 37 C.F.R. § 1.98 and the Examiner is respectfully requested to consider and cite the listed documents.

The Commissioner is hereby authorized to charge any deficiency in the fees filed, asserted to be filed or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Deposit Account No. 04-1073, under Order No. M4065.0724/P724. A duplicate copy of this paper is enclosed.

Dated: December 18, 2003

Respectfully submitted,

By 

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APPENDIX A

Japanese patent application publication No. 56126916A by Akira: this published application generally relates to, inter alia, diffusing selenium with high accuracy into a chalcogenide with silver by use of photoresist and thermal treatment.

Abdel-All, et al., Vacuum 59 (2000) 845-853: published in December, this document generally relates to, inter alia, the electrical properties of $\text{Ge}_5\text{As}_{38}\text{Te}_{57}$ as a function of temperature.

*Adler and Moss, J. Vac. Sci. Technol. 9 (1972) 1182-1189: this document generally relates to, inter alia, two types of electrical/material switching – threshold and memory, in amorphous materials; the effects of temperature, pressure, and frequency on switching; and the physics of threshold voltage and memory.

Adler et al., Ref. Mod. Phys. 50 (1978) 209-220: this document generally relates to, inter alia, threshold switching in amorphous alloys, state (“on” and “off”) characteristics, and glass properties.

Afifi, et al., Appl. Phys. A 55 (1992) 167-169: this document generally relates to, inter alia, SeGe-Sb glasses.

*Afifi, et al., J. Phys. 17 (1986) 335-342: this document generally relates to, inter alia, electrical and thermal conductivity of $\text{Ge}_x\text{Se}_{1-x}$ compositions as a function of temperature. $\text{Ge}_{25}\text{Se}_{75}$ stoichiometry is disclosed.

Alekperova and Gadzhieva, 23 (1987) 137-139: this document generally relates to, inter alia, a characteristic diode state in Ag_2Se compositions upon heating (to 376-400°K).

*Aleksiejunas and Cesnys, Phys. Stat. Sol. (a) 19 (1973) K169-K171: this document generally relates to, inter alia, the subjects of selenium investigation and how Se-Ag₂Se contributes silver ions to a selenium composition.

Angell, Annu. Rev. Phys. Chem. 43 (1992) 693-717: this document generally relates to, inter alia, the presence of ion conductors in solids.

Aniya, Solid State Ionics 136-137 (November 2,2000) 1085-1089: this document generally relates to, inter alia, ion conductor glasses.

Asahara and Izumitani, J. Non-Cryst. Solids 11 (1972) 97-104: this document generally relates to, inter alia, Cu-As-Se glass.

Asokan, et al., Phys. Rev. Lett. 62 (1989) 808-810: this document generally relates to, inter alia, Ge_xSe_{100-x} glasses and their transition from semiconductor-like material to metal-like material.

*Axon Technologies Corp., *Technology Description: Programmable Metallization Cell*: this believed publication generally relates to, inter alia, use of chalcogenides doped with metal much as silver or copper to create solid state switch with lower voltage requirement.

Baranovskii and Cordes, J. Chem. Phys. 111 (1999) 7546-7557: this document generally relates to, inter alia, ionic glasses and conduction (percolation theory).

Belin et al., Sol. St. Ionics 136-137 (November 2,2000) 1025-1029: this document generally relates to, inter alia, conductivity spectra of the glass 0.5Ag₂S-0.5GeS₂ and the temperature dependency of the conductivity.

Belin, et al., Solid State Ionics 143 (July 2, 2001) 445-455: this document generally relates to, inter alia, the electrical properties of $\text{Ag}_7\text{GeSe}_5\text{I}$ – an argyrodite compound.

Benmore and Salmon, Phys. Rev. Lett. 73 (1994) 264-267: this document generally relates to, inter alia, the characteristics of chalcogenide alloys.

Bernede, Thin Solid Films 70 (1980) L1-L4: this document is in the French language and the Applicant has no translation. It is presently understood to generally relate to, inter alia, metal- Ag_2Se -metal sandwich devices.

Bernede, Thin Solid Films 81 (1981) 155-160: this document generally relates to, inter alia, memories of selenium alloys with metal (e.g., Ag) electrodes, where the “on” memory states require constant voltage.

Bernede, Phys. Stat. Sol. (a) 57 (1980) K101-K104: this document generally relates to, inter alia, metal- Ag_2Se -P systems.

Bernede and Abachi, Thin Solid Films 131 (1985) L61-L64: this document generally relates to, inter alia, metal-insulator-metal thin films with electroforming effects; the films have silver, gold and copper electrodes.

*Bernede, et al., Thin Solid Films 97 (1982) 165-171: this document generally relates to, inter alia, $\text{Ag}_2\text{Se}/\text{Se}/\text{Metal}$ thin film sandwiches, which were studied by shape of electrodes (e.g., symmetrical or asymmetrical).

Bernede, et al., Phys. Stat. Sol. (a) 74 (1982) 217-224: this document generally relates to, inter alia, switching in $\text{Al-Al}_2\text{O}_3\text{Ag}_{2-x}\text{Se}_{1+x}$ devices.

Bondarev and Pikhitsa, Solid State Ionics 70/71 (1994) 72-76: this document generally relates to, inter alia, $\text{Ag}^{(-)}/\text{RbAg}_4\text{I}_5$ boundary – depletion layer, and dendritic electrodeposition.

*Boolchand, Asian Journal of Physics (2000) 9, 709-72: this document generally relates to, inter alia, $\text{Ge}_x\text{Se}_{1-x}$ glasses, which have selenium-rich and germanium-rich clusters, and the intrinsically-broken bond characteristics thereof.

*Boolchand and Bresser, Nature 410 (2001) 1070-1073: published April 26, this document generally relates to, inter alia, Ag_2Se as an electrolyte additive to glass, e.g., GeSe_4 . $\text{Ge}_{30}\text{Se}_{70}$ glass was found not to work well because of Ag_2Se crystallization.

*Boolchand, et al., J. Optoelectronics and Advanced Materials, 3 (September 2001), 703: this document generally relates to, inter alia, a review of Raman tool scattering of chalcogenide glasses. The floppyness and rigidness is observed. $\text{Ge}_x\text{Se}_{1-x}$ is disclosed, as is a stoichiometry of $\text{Ge}_{25}\text{Se}_{75}$.

*Boolchand, et al., Properties and Applications of Amorphous Materials, M.F. Thorpe and Tichy, L. (eds.) Kluwer Academic Publishers, the Netherlands, 2001, pp. 97-132: this document generally relates to, inter alia, the prediction of glass rigidity in $\text{Ge}_x\text{Se}_{1-x}$ glass, e.g., $\text{Ge}_{23}\text{Se}_{77}$.

*Boolchand, et al., Diffusion and Defect Data, Vol. 53-54 (1987) 415-420: this document generally relates to, inter alia, thermal annealing of $\text{Ge}_x\text{Se}_{1-x}$ films.

*Boolchand, et al., Phys. Rev. B 25 (1982) 2975-2978: this document generally relates to, inter alia, the examination of GeSe glass having Sn impurities by Mossbauer spectroscopy. Investigations into glass network topology, which has an intrinsically broken bond backbone, suggesting Ge and Se rich clusters.

Boolchand, et al., Sol. State Comm. 45 (1983) 183-185: this document generally relates to, inter alia, $\text{Ge}_x\text{Se}_{1-x}$ and $\text{Ge}_x\text{S}_{1-x}$ glasses.

*Boolchand and Bresser, Dep. Of ECECS, Univ. Cincinnati 45221-0030: this document generally relates to, inter alia, $\text{Ge}_x\text{Se}_{1-x}$ and the relation of glass transition temperature to Ge concentration in backbone. Although the publication date of this reference is not known to the Applicant, it was revised October 28, 1999 and is believed to be publicly available at the University of Cincinnati, Department of Electrical and Computer Engineering and Computer Science.

Boolchand and Grothaus, Eds. Chadi and Harrison, Proc. Int. Conf. Phys, Semicond., 17th (1985) 833-36: this document generally relates to, inter alia, GeSe and GeS glasses and the importance of a broken chemical order therein.

Bresser, et al., Phys. Rev. Lett. 56 (1986) 2493-2496: this document generally relates to, inter alia, an investigation of c-GeSe₂ structure.

Bresser, et al., J. de Physique 42 (1981) C4-193-C4-196: this document generally relates to, inter alia, the characteristics of GeSe₂ and GeS₂ glasses.

Bresser, et al., Hyperfine Interactions 27 (1986) 389-392: this document generally relates to, inter alia, germanium selenide glasses doped with tellurium.

Cahen, et al., Science 258 (1992) 271-274: this document generally relates to, inter alia, chalcopyrite CuInSe_2 glasses.

Chatterjee, et al., J. Phys. D: Appl. Phys. 27 (1994) 2624-2627: this document generally relates to, inter alia, $\text{As}_x\text{Te}_{100-x-y}\text{Se}_y$ glasses and the current, voltage, and electrical switching behavior. Discloses applicability in read mostly memories.

*Chen and Tai, Appl. Phys. Lett. 37 (1980) 1075-1077: this document generally relates to, inter alia, silver photodoping of $\text{Ge}_x\text{Se}_{1-x}$ and whisker formation (crystalline Ag_2Se).

Chen and Cheng, J. Am. Ceram. Soc. 82 (1999) 2934-2936: this document generally relates to, inter alia, germanium containing chalcogenides doped with Si_3N_4 .

Chen, et al., J. Non-Cryst. Solids 220 (1997) 249-253: this document generally relates to, inter alia, $\text{As}_{10}\text{Ge}_{30}\text{Se}_{60}$ glasses (and the like) doped with Si_3N_4 .

Cohen, et al., J. Non-Cryst. Solids 8-10 (1972) 885-891: this document generally relates to, inter alia, Ge-Te-X glasses as memory devices.

Croitoru, et al., J. Non-Cryst. Solids 8-10 (1972) 781-786: this document generally relates to, inter alia, the physics of conductivity in Ge-containing films.

Dalven and Gill, J. Appl. Phys. 38 (1967) 753-756: this document generally relates to, inter alia, beta- Ag_2Te .

Davis, Search 1 (1970) 152-155: this document generally relates to, inter alia, the subject of amorphous semiconductors as compared to glass.

*Dearnaley, et al., Rep. Prog. Phys. 33 (1970) 1129-1191: this document generally relates to, inter alia, background information about glass and memory.

*Dejus, et al., J. Non-Cryst. Solids 143 (1992) 162-180: this document generally relates to, inter alia, Ag-Ge-Se glass with Ag primarily bonded to Se. The reference discloses glass preparation.

den Boer, Appl. Phys. Lett. 40 (1982) 812-813: this document generally relates to, inter alia, a-Si:H sandwich structures and threshold switching from a low to high conductance.

Drusedau, et al., J. Non-Cryst. Solids 198-200 (1996) 829-832: this document generally relates to, inter alia, work with a-Si:H multilayers optoelectrical properties.

El Bouchairi, et al., Thin Solid Films 110 (1983) 107-113: this document generally relates to, inter alia, $\text{Ag}_{2-x}\text{Se}_{1+x}$ thin film electrical characteristics and metal-like conduction.

El Gharras, et al., J. Non-Cryst. Solids 155 (1993) 171-179: this document generally relates to, inter alia, photoconductivity of amorphous Se and Ge-Se alloy evaporated films, and reduction of photocurrent by increase of Ge content.

*El Ghrandi, et al., Thin Solid Films 218 (1992) 259-273: this document generally relates to, inter alia, GeSe films deposited by PECVD, Ag evaporation deposition onto glass and photodissolution into same, and optical properties are investigated. GeSe stoichiometries of 30/70 and 25/75, respectively, are disclosed.

*El Ghrandi, et al., Phys. Stat. Sol. (a) 123 (1991) 451-460: this document generally relates to, inter alia, dissolution of Ag into $\text{GeSe}_{5.5}$ glass by flash evaporation.

El-kady, Indian J. Phys. 70 A (1996) 507-516: this document generally relates to, inter alia, $\text{Ge}_{21}\text{Se}_{17}\text{Te}_{62}$ glass and memory, switching, and current controlled negative resistance.

Elliott, J. Non-Cryst. Solids 130 (1991) 85-97: this document generally relates to, inter alia, mechanisms of photodissolution of metals (e.g., Ag) in chalcogenides based on ionic and electronic charge carriers.

*Elliott, J. Non-Cryst. Sol. 130 (1991) 1031-1034: this document generally relates to, inter alia, the photodissolution of metals (e.g., Ag) in chalcogenide glasses and the physics thereof.

Elsamanoudy, et al., Vacuum 46 (1995) 701-707: this document generally relates to, inter alia, studies of quaternary chalcogenide films with Te-As-Ge-Si sandwich structures between electrodes.

*El-Zahed and El-Korashy, Thin Solid Films 376 (November 1,2000) 236-240: this document generally relates to, inter alia, $\text{Ge}_{20}\text{Bi}_x\text{Se}_{80-x}$ film analysis regarding conduction and changes from p to n type.

Fadel, Vacuum 44 (1993) 851-855: this document generally relates to, inter alia, a study of the switching and memory characteristics of $\text{Se}_{75}\text{Ge}_{25-x}\text{As}_x$ films.

*Fadel and El-Shair, Vacuum 43 (1992) 253-257: this document generally relates to, inter alia, $\text{Se}_{75}\text{Ge}_7\text{Sb}_{18}$ glass electrical conduction and thermal character.

Feng, et al., Phys. Rev. Lett. 78 (1997) 4422-4425: this document generally relates to, inter alia, germanium selenide and germanium sulfide materials.

*Feng, et al., J. Non-Cryst. Solids 222 (1997) 137-143: this document generally relates to, inter alia, the structural character of $\text{Ge}_x\text{S}_{1-x}$ glass, e.g., hardness and elasticity.

*Fischer-Colbrie, et al., Phys. Rev. B 38 (1988) 12388-12403: this document generally relates to, inter alia, photodiffused Ag-GeSe₂ and the interaction between doped Ag with Se atoms and Ge with Ge atoms.

Fleury, et al., Phys. Stat. Sol. (a) 64 (1981) 311-316: this document generally relates to, inter alia, amorphous selenium films and their conductance.

Fritzsche, J. Non-Cryst. Sol. 6 (1971) 49-71: this document generally relates to, inter alia, background information on chalcogenides as semiconductors.

Fritzsche, Annual Review of Mat. Sci. 2 (1972) 697-744: this document generally relates to, inter alia, background information on amorphous semiconductors.

Gates, et al., J. Am. Chem. Soc. (2001): this document generally relates to, inter alia, creating Ag₂Se nanowires by chemical reaction.

Gosain, et al., Jap. J. Appl. Phys. 28 (1989) 1013-1018: this document generally relates to, inter alia, germanium telluride glasses sandwiched in electrodes and the physics thereof.

*Guin et al., J. Non-Cryst. Sol. 298 (March 28,2002) 260-269: this document generally relates to, inter alia, germanium selenide (GeSe) glass with low hardness, the mechanical properties of which are investigated. Stoichiometries of the glass are disclosed as being, inter alia, 10/90, 20/80, and 30/70, respectively.

*Guin et al., J. Am. Ceram. Soc. 85 (June 2002) 1545-1552: this document generally relates to, inter alia, germanium selenide glasses and a study of the hardness properties thereof. Glass stoichiometries of 40/60 and 20/80, respectively, are disclosed.

Gupta, J. Non-Cryst. Sol. 3 (1970) 148-154: this document generally relates to, inter alia, switching in chalcogenides.

Haberland and Stiegler, J. Non-Cryst. Solids 8-10 (1972) 408-414: this document generally relates to, inter alia, glasses containing Te, As, Ge, and Si, and pulse sequence and time factors in switching.

Haifz, et al., J. Apply. Phys. 54 (1983) 1950-1954: this document generally relates to, inter alia, As-Se-Cu glasses.

Hajto, et al., Int. J. Electronics 73 (1992) 911-913: this document generally relates to, inter alia, metal/a-Si:H/metal devices.

Hajto, et al., J. Non-Cryst. Solids 266-269 (May 1,2000) 1058-1061: this document generally relates to, inter alia, a-Si:H ion conductors, polarity-dependant digital and analogue memory, and dependency on contact metals.

Hajto, et al., J. Non-Cryst. Solids 198-200 (1996) 825-828: this document generally relates to, inter alia, electroformed V/a-Si:H/Cr devices.

Hajto, et al., Phil. Mag. B 63 (1991) 349-369: this document generally relates to, inter alia, p+ type amorphous Si memory structures with polarity dependent analogue switching.

Hayashi, et al., Japan. J. Appl. Phys. 13 (1974) 1163-1164: this document generally relates to, inter alia, Au-CdS(CdSe)-Au systems and metal-Se-Sn-SnO₂ systems.

*Hegab, et al., Vacuum 45 (1994) 459-462: this document generally relates to, inter alia, Ge₂₀M₇₅Sb₁₈ glass electrical conduction and thermal character.

Helbert et al., SPIE Vol. 333 Submicron Lithography (1982): this publication generally relates to, inter alia, hybrid ultragraphic process using both electron beam and conventional optical exposure within the same device level with a photoresist.

Hilt, dissertation (1999): this publication generally relates to, inter alia, stability of chalcogenides such as Ge_xSe_{1-x} with Ag doping by photodissolution and thermal diffusion.

Hirose et al., Phys. Stat. Sol. (1980): this publication generally relates to, inter alia, switch and memory phenomena in amorphous As₂S₃ with photo-doped Ag, including new mechanism, electrical reliability, rapid memory performance, thermal characteristics and durability.

Hirose and Hirose, J. Appl. Phys. 47 (1976) 2767-2772: this document generally relates to, inter alia, Ag photodoped As_2S_3 , polarized switching, and dendrite formation.

Holmquist et al., 62 J. Amer. Ceram. Soc., No. 3-4 (March-April 1979): this publication generally relates to, inter alia, reactions and diffusion of Ag in arsenic chalcogenide glass below the glass transition temperature, including solubility information and concentration dependence of Ag diffusion in these glasses.

Hong and Speyer, J. Non-Cryst. Solids 116 (1990) 191-200: this document generally relates to, inter alia, Cd-Ge-As glass with Ag contacts.

Hosokawa, J. Optoelectronics and Advanced Materials 3 (2001) 199-214: this document generally relates to, inter alia, x-ray scattering experiments on glassy $\text{Ge}_x\text{Se}_{1-x}$.

Hu, et al., J. Non-Cryst. Solids 227-230 (1998) 1187-1191: this document generally relates to, inter alia, a-Si:H with Cr and V electrodes.

Hu, et al., Phil. Mag. B. 74 (1996) 37-50: this document generally relates to, inter alia, a-Si:H glasses doped with Cr and analogue memory.

Hu, et al., Phil. Mag. B 80 (January 1, 2000) 29-43: this document generally relates to, inter alia, a-Si:H films doped with Cr-p+.

Huggett et al., 42 Appl. Phys. Lett., No. 7 (April 1983): this publication generally relates to, inter alia, reactive sputter etching to develop silver-sensitized $\text{Ge}_x\text{Se}_{1-x}$ photoresist.

Iizima, et al., Solid State Comm. 8 (1970) 153-155: this document generally relates to, inter alia, switching and memory effects in $\text{As-Te-I}^{1,2}$ and As-Te-Ge-Si^3 glass systems. Thermal breakdown is proposed switching effect.

Ishikawa and Kikuchi, J. Non-Cryst. Solids 35 & 36 (1980) 1061-1066: this document generally relates to, inter alia, Ge_2S_2 films with Ag photodissolved therein.

*Iyetomi, et al., J. Non-Cryst. Solids 262 (February 2000) 135-142: this document generally relates to, inter alia, Ag/Ge/Se glasses as a composite of GeSe_2 and Ag_2Se (a fast ion conductor) and polarizability of Se ions.

Jones and Collins, Thin Solid Films 40 (1977) L15-L18: this document generally relates to, inter alia, switching in Se films and switching back with reverse pulse.

Joullie and Marucchi, Phys. Stat. Sol. (a) 13 (1972) K105-K109: this document generally relates to, inter alia, As_2Se_7 glass.

Joullie and Marucchi, Mat. Res. Bull. 8 (1973) 433-442: this document generally relates to, inter alia, As_2Se_5 film conduction and switching.

Kaplan and Adler, J. Non-Cryst. Solids 8-10 (1972) 538-543: this document generally relates to, inter alia, thermal effects on semiconductor switching.

Kawaguchi et al., 164-166 J. Non-Cryst. Solids (1993): this publication generally relates to, inter alia, deposition mechanism of Ag particles on Ag-rich Ag-As-S glass from a view-point of electrical effects.

*Kawaguchi, et al., J. Appl. Phys. 79 (1996) 9096-9104: this document generally relates to, inter alia, Ag-rich chalcogenide glass, Ge_3S_7 -Ag and $\text{Ge}_{30}\text{Se}_{70}$ -Ag, max Ag content of 67%, graphs phase diagram, and discloses that Ag works better than Cu.

*Kawaguchi and Masui, Jpn. J. Appl. Phys. 26 (1987) 15-21: this document generally relates to, inter alia, silver photodoping of chalcogenide films, e.g., $\text{Ge}_{30}\text{Se}_{70}$ films.

*Kawasaki, et al., Solid State Ionics 123 (1999) 259-269: this document generally relates to, inter alia, the electrical properties of $\text{Ag}_x(\text{GeSe}_3)_{1-x}$, conductivity EMF

measurements, glass composition, X-ray diffraction, T_g and T_c , Ag ion transport, and glass structure.

*Kluge, et al., J. Non-Cryst. Solids 124 (1990) 186-193: this document generally relates to, inter alia, photodiffusion of silver into Ge_xSe_{100-x} layers, how this differs from ion beam induced diffusion, $Ge_{30}Se_{70}$ stoichiometry, Ag_2Se , and percolation threshold.

*Kolobov, J. Non-Cryst. Solids 198-200 (1996) 728-731: this document generally relates to, inter alia, p-type conductive chalcogenides, materials, and physics thereof.

*Kolobov, J. Non-Cryst. Solids 137-138 (1991) 1027-1030: this document generally relates to, inter alia, doped and undoped glass layers as a p-n junction.

*Kolobov and Elliott, Advances in Physics (1991): this publication generally relates to, inter alia, photodoping (photodiffusion/photodissolution) of amorphous chalcogenides by metals, particularly silver.

Korkinova and Andreichin, J. Non-Cryst. Solids 194 (1996) 256-259: this document generally relates to, inter alia, polarization of chalcogenide glass as depending on the materials used for electrode contacts.

*Kotkata, et al., Thin Solid Films 240 (1994) 143-146: this document generally relates to, inter alia, GeSe glass switching and film thickness, memory, current filament, chemical and mechanical switching properties, and discloses that heat treatment or aging improves switching.

*Kozicki and Mitkova, Proceedings of the XIX International Congress on Glass, Society for Glass Technology (2001): this publication generally relates to, inter alia, the physical effects of introduction of Ag into chalcogenide glasses, where introduction is by photodiffusion.

*Michael N. Kozicki, Programmable Metallization Cell Technology Description, February 18, 2000: this publication generally relates to, inter alia, programmable metallization cells (PMC) for storing memory as resistive states. The PMC cells use a chalcogenide glass region bounded by electrodes as a memory device. The chalcogenide glass can be germanium selenide. The electrodes can be an oxidizable and indifferent material. Multiple-bit cells are disclosed; relying on controlling an amount of electrodeposit. Barrier layers of metal oxides, isolation diodes, and access transistors are also disclosed.

*Michael N. Kozicki, Axon Technologies Corp. and Arizona State University, Presentation to Micron Technology, Inc., April 6, 2000: this publication generally relates to, inter alia, programmable metallization cells (PMC) for storing memory as resistive states and operating parameters for PMC devices.

*Kozicki et al., Proceedings of the 1999 Symposium on Solid State Ionic Devices (1999): this publication generally relates to, inter alia, physical and electrical characteristics of metal doped chalcogenide films (photodoped $\text{Ag}_4\text{As}_2\text{S}_3$) between electrodes, useful in memories, configurable connections, and self-repairing interconnections.

*Kozicki et al., Superlattices and Microstructures, 27 (2000): this publication generally relates to, inter alia, solid solutions of metals (e.g., silver) in arsenic trisulfide and their physical and electrical characteristics.

*Kozicki et al., Microelectronic Engineering, vol. 63/1-3 (2002): this publication generally relates to, inter alia, the photodiffusion of Ag into germanium selenide glass films, the amount of Ag that can be incorporated in to such a film by photodiffusion, and the characteristics of the resulting doped films.

Lakshminarayan, et al., J. Instn. Electronics & Telecom. Engrs. 27 (1981) 16-19: this document generally relates to, inter alia, tellurium-containing chalcogenide glasses.

Lal and Goyal, Indian Journal of Pure & Appl. Phys. 29 (1991) 303-304: this document generally relates to, inter alia, theory on chalcogenide switching.

*Leimer et al., Phys. Stat. Sol. (a) 29 (1975) K129-K132: this document generally relates to, inter alia, germanium selenide glass polarization behavior, e.g., inductive and capacitive components.

*Leung, et al., Appl. Phys. Lett. 46 (1985) 543-545: this document generally relates to, inter alia, photoinduced diffusion of Ag into $\text{Ge}_x\text{Se}_{1-x}$ and techniques for same.

Matsushita, et al., Jap. J. Appl. Phys. 11 (1972) 1657-1662: this document generally relates to, inter alia, Se-SnO₂ film switching and reversibility.

Matsushita, et al., Jpn. J. Appl. Phys. 11 (1972) 606: this document generally relates to, inter alia, polarized memory effect in Se films.

Mazurier, et al., Journal de Physique IV 2 (1992) C2-185 - C2-188: this document generally relates to, inter alia, Te-based glasses.

McHardy et al., 20 J. Phys. C.: Solid State Phys. (1987): this publication generally relates to, inter alia, sensitivity and high resolution of metals in amorphous chalcogenides by electron and UV radiation.

Messoussi, et al., Mat. Chem. And Phys. 28 (1991) 253-258: this document generally relates to, inter alia, selenium films and Bi electrodes.

*Mitkova and Boolchand, J. Non-Cryst. Solids 240 (1998) 1-21: this document generally relates to, inter alia, the analysis of Group IV and V chalcogenides.

*Mitkova and Kozicki, J. Non-Cryst. Solids 299-302 (May 14, 2002) 1023-1027: this document generally relates to, inter alia, photodissolution of Ag into Se-rich Ge-Se glasses for use in memory devices. The information disclosed in this reference was available to and known by the inventors prior to the filing of the application.

*Mitkova, et al., Phys. Rev. Lett. 83 (1999) 3848-3851: this document generally relates to, inter alia, Ag doped chalcogenides, $\text{Ge}_{20}\text{Se}_{80}$ stoichiometry is disclosed, Se rich glasses, Ge rich glasses, stoichiometric glasses, and presence of Ag_2Se .

*Miyatani, J. Phys. Soc. Japan 34 (1973) 423-432: this document generally relates to, inter alia, electrical and ionic properties of solid solutions (e.g., doped glass), polarization, conductivity, Ag_2Se and Cu_2Se .

Miyatani, J. Phys. Soc. Japan 13 (1958) 317: this document generally relates to, inter alia, experiments regarding the electronic conductivity, ionic conductivity, hall constant, thermoelectric power, and Nernst coefficient of Ag_2Se as function of the e.m.f., E, the galvanic cell, or the deviation from stoichiometric composition.

*Miyatani, J. Phys. Soc. Japan 14 (1959) 996-1002: this document generally relates to, inter alia, Ag_2Te and Ag_2Se ion conduction and the chemical potential of silver ions.

Mott, J. Non-Cryst. Sol. 1 (1968) 1-17: this document generally relates to, inter alia, glasses with vanadium or iron.

*Nakayama, et al., Jpn. J. Appl. Phys. 32 (1993) 564-569: this document generally relates to, inter alia, electrically erasable nonvolatile memories in chalcogenide films of $\text{As}_x\text{Sb}_y\text{Te}_z$, flash evaporative deposition techniques, a high set-voltage compared to read-voltage, V_t creates a "filament," and refresh-type pulse.

*Nakayama, et al., Jpn. J. Appl. Phys. 39 (November 15, 2000) 6157-6161: this document generally relates to, inter alia, phase transition random access memory (PRAM) made of chalcogenide glass.

*Nang et al., Jap. J. App. Phys. 15 (1976) 849-853: this document generally relates to, inter alia, $\text{Ge}_x\text{Se}_{1-x}$ electrical and optical properties; it also discloses $\text{Ge}_{.80}\text{Se}_{.20}$, $\text{Ge}_{.60}\text{Se}_{.40}$, and $\text{Ge}_{.50}\text{Se}_{.50}$.

Narayanan, et al., Phys. Rev. B 54 (1996) 4413-4415: this document generally relates to, inter alia, chalcogenide glass switching as thermally originated.

*Neale and Aseltine, , IEEE Transactions On Electron Dev. Ed-20 (1973) 195-209: this document generally relates to, inter alia, read mostly memories with chalcogenides (e.g., Ge, Te), also discloses "floating gate," and material combinations including Ge and Se.

Ovshinsky and Fritzsche, Metallurgical Transactions 2 (1971) 641-645: this document generally relates to, inter alia, reversible changes in amorphous Si, Be, and B using a laser to write and erase.

Ovshinsky, Phys. Rev. Lett. 21 (1968) 1450-1453: this document generally relates to, inter alia, rapid and reversible resistive switching by electric field in amorphous semiconductors.

Owen, et al., IEE Proc. 129 (1982) 51-54: this document generally relates to, inter alia, a-Si:H, gold or aluminum dots and silver paste.

Owen, et al., Phil. Mag. B 52 (1985) 347-362: this document generally relates to, inter alia, photoinduced chalcogenide effects (As_2S_3) both reversible and irreversible.

*Owen, et al., Int. J. Electronics 73 (1992) 897-906: this document generally relates to, inter alia, threshold and memory switching a-Si:H ion conductor, polarity-dependant digital memory, analogue memory, and device operation dependency on metal contacts.

Owen et al., Nanostructure Physics and Fabrication (1989): this publication generally relates to, inter alia, photo-induced structural or physico-chemical changes of amorphous chalcogenides when exposed to light/irradiation, affecting chemical solubility.

Pearson and Miller, App. Phys. Lett. 14 (1969) 280-282: this document generally relates to, inter alia, glass diodes.

*Pinto and Ramanathan, Appl. Phys. Lett. 19 (1971) 221-223: this document generally relates to, inter alia, electric field inducement of glass switching “filamentary” path.

Popescu, Solid-State Electronics 18 (1975) 671-681: this document generally relates to, inter alia, the physics of chalcogenide switching.

Popescu and Croitoru, J. Non-Cryst. Solids 8-10 (1972) 531-537: this document generally relates to, inter alia, switching behavior and thermal instability in chalcogenide glasses.

Popov, et al., Phys. Stat. Sol. (a) 44 (1977) K71-K73: this document generally relates to, inter alia, investigations into threshold and memory switching effects in amorphous selenium with electrodes of Ca, Ni, Ag, and Al.

*Prakash, et al., J. Phys. D: Appl. Phys. 29 (1996) 2004-2008: this document generally relates to, inter alia, switching of $\text{Ge}_{10}\text{As}_{45}\text{Te}_{45}$ glass, study of threshold voltage concept and switch back to off, suitability for read mostly memory.

Rahman and Sivarama, Mat. Sci. Eng. B12 (1992) 219-222: this document generally relates to, inter alia, chalcogenide glass with no exothermic crystallization reaction above T_g being of a threshold-switching type.

*Ramesh, et al., Appl. Phys. A 69 (1999) 421-425: this document generally relates to, inter alia, electrical switching in GeTe with Ag or Cu and thermal character investigations.

Rose, et al., J. Non-Cryst. Solids 115 (1989) 168-170: this document generally relates to, inter alia, a-Si with Cr or V contacts.

Rose et al., Mat. Res. Soc. Symp. Proc. V258 (1992) 1075-1080: this document generally relates to, inter alia, a-Si:H memory.

Schuoocker and Rieder, J. Non-Cryst. Solids 29 (1978) 397-407: this document generally relates to, inter alia, As-Te-Ge film sandwiches with Molybdenum electrodes.

Sharma and Singh, Proc. Indian Natn. Sci. Acad. 46, A, (1980) 362-368: this document generally relates to, inter alia, evaporated Se films and their electrical conductivity.

*Sharma, Ind. J. Of Pure and Applied Phys. 35 (1997) 424-427: this document generally relates to, inter alia, n-type Ag_2Se and other material stoichiometries. The device conductivity is analyzed, as is the grain size as a factor in device ability to polarize.

Shimizu et al., 46 B. Chem Soc. Japan, No. 12 (1973): this publication generally relates to, inter alia, electric conductivity increase by increasing Ag-photodoping of chalcogenide glass.

Snell, et al., J. Non-Cryst. Solids 137-138 (1991) 1257-1262: this document generally relates to, inter alia, a-Si:H analogue memory by applying voltages of increasing magnitude.

Snell et al., Mat. Res. Soc. Symp. Proc. V 297 (1993) 1017-1021: this document generally relates to, inter alia, a-Si:H analogue memory.

Steventon, J. Phys. D: Appl. Phys. 8 (1975) L120-L122: this document generally relates to, inter alia, switching in chalcogenides, resistively changes, and formation of microfilaments at switch.

Steventon, J. Non-Cryst. Solids 21 (1976) 319-329: this document generally relates to, inter alia, chalcogenide switching with pulses and multiple pulse resetting.

Stocker, App. Phys. Lett. 15 (1969) 55-57: this document generally relates to, inter alia, switching character of bulk and thin film glasses.

Tanaka, Mod. Phys. Lett. B 4 (1990) 1373-1377: this document generally relates to, inter alia, photodoping mechanism and Ag/As₃₀Se₇₀.

Tanaka, et al., Solid State Comm. 8 (1970) 387-389: this document generally relates to, inter alia, thermal effect on switching in chalcogenides and As-Te-(Ge or Si).

*Thornburg, J. Elect. Mat. 2 (1973) 3-15: this document generally relates to, inter alia, division of chalcogenides into stoichiometric compounds with no changes upon crystallization, stoichiometric compounds with changes upon crystallization, and non-stoichiometric which phase separate on crystallization, As₂Se, and filament growth as a function of bias applied.

Thornburg, J. Non-Cryst. Solids 11 (1972) 113-120: this document generally relates to, inter alia, As₂Se₃ glass switching sandwich structure.

*Thornburg and White, (1972) 4609-4612: this document generally relates to, inter alia, precipitation of As particles out of As_2Se_3 glass and the alignment in a filament.

*Tichy and Ticha, J. Non-Cryst. Solids 261 (2000) 277-281: published in January, this document generally relates to, inter alia, $\text{Ge}_x\text{Se}_{1-x}$ glass forming ability and 20/80 respective stoichiometry.

Titus, et al., Phys. Rev. B 48 (1993) 14650-14652: this document generally relates to, inter alia, percolation and chemical thresholds of chalcogenide glass.

*Tranchant, et al., Proceedings of the 6th Riso International Symposium. 9-13 September 1985: this document generally relates to, inter alia, GeSe glass with Ag, silver photodissolution, and generation of Ag_2Se .

Tregouet and Bernede, Thin Solid Films 57 (1979) 49-54: this document generally relates to, inter alia, Ag_2Te glass characteristics.

Uemura, et al., J. Non-Cryst. Solids 117-118 (1990) 219-221: this document generally relates to, inter alia, Ge_4Se_6 raman measurements and glass structure.

*Uttecht, et al., J. Non-Cryst. Solids 2 (1970) 358-370: this document generally relates to, inter alia, As-Te-Ge glass, V_t switching, filament formation, and reversal of voltage causes filament to grown in opposite direction.

Viger, et al., J. Non-Cryst. Solids 33 (1976) 267-272: this document generally relates to, inter alia, Se films dark-conductivity and photoconductivity.

*Vodenicharov, et al., Mat. Chem. and Phys. 21 (1989) 447-454: this document generally relates to, inter alia, M-GeSe-M films investigation for dc conductivity.

Wang, et al., IEEE Electron Dev. Lett. 13 (1992) 471-472: this document generally relates to, inter alia, antifuses.

Weirauch, App. Phys. Lett. 16 (1970) 72-73: this document generally relates to, inter alia, chalcogenide device resistively changes in high electric fields.

*West, et al., J. Electrochem. Soc. 145 (1998) 2971-2974: this document generally relates to, inter alia, Ag/As₂₄S₃₆Ag₄₀/Ag systems and Ag transport.

*West, Ph.D. Dissertation, ASU 1998: this document generally relates to, inter alia, metal dendrite memory with Ag or Cu doped solid electrolyte, photodissolution of Ag into As₂S₃ glass, lateral devices with silver electrodes, vertical devices with Ag electrodes, write voltages and lesser read voltages, and pinpoint electrode surrounded by ring electrode. Although the exact publication date for this document is not known, it is believed to be available at Arizona State University.

Zhang, et al., J. Non-Cryst. Solids 151 (1992) 149-154: this document generally relates to, inter alia, T_g investigation for glasses.

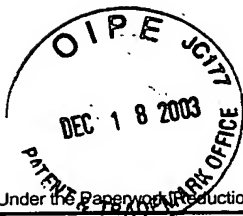


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				Application Number	10/622,482
				Filing Date	July 31, 2003
				First Named Inventor	Kristy A. Campbell
				Art Unit	N/A
				Examiner Name	Not Yet Assigned
Sheet	1	of	11	Attorney Docket Number	M4065.0724/P724

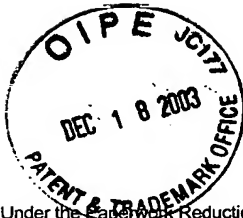
U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (if known)			
	AA	2002/0000666	1/3/2002	Kozicki et al.	
	AB	2002/0072188	6/13/2002	Gilton	
	AC	2002/0106849	08/08/2002	Moore	
	AH	2002/0123169	09/05/2002	Moore et al.	
	AI	2002/0123170	09/05/2002	Moore et al.	
	AJ	2002/0123248	09/05/2002	Moore et al.	
	AK	2002/0127886	09/12/2002	Moore et al.	
	AL	2002/0132417	09/09/2002	Li	
	AF	2002/0160551	10/31/2002	Harshfield	
	AG	2002/0163828	11/07/2002	Krieger et al.	
	AM	2002/0168820	11/2002	Kozicki	
	AN	2002/0168852	11/14/2002	Harshfield et al.	
	AO	2002/0190289	12/19/2002	Harshfield et al.	
	AP	2002/0190350	12/19/2002	Kozicki et al.	
	AQ	2003/0001229	01/02/2003	Moore et al.	
	AR	2003/0027416	02/06/2003	Moore	
	AS	2003/0032254	02/13/2003	Gilton	
	AT	2003/0035314	02/20/2003	Kozicki	
	AU	2003/0035315	02/20/2003	Kozicki	
	AV	2003/0038301	02/27/2003	Moore	
	AW	2003/0043631	03/06/2003	Gilton et al.	
	AX	2003/0045049	03/06/2003	Campbell et al.	
	AY	2003/0045054	03/06/2003	Campbell et al.	
	AZ	2003/0047765	03/13/2003	Campbell	
	AA1	2003/0047772	03/13/2003	Li	
	AB1	2003/0047773	03/13/2003	Li	
	AC1	2003/0048519	03/13/2003	Kozicki	
	AD1	2003/0049912	03/13/2003	Campbell et al.	
	AE1	2003/0068861	04/10/2003	Li	
	AF1	2003/0068862	04/10/2003	Li	
	AG1	2003/0095426	05/22/2003	Hush et al.	
	AH1	2003/0096497	05/22/2003	Moore et al.	
	AI1	2003/0107105	06/12/2003	Kozicki	
	AJ1	2003/0117831	06/26/2003	Hush	
	AK1	2003/0128612	07/10/2003	Moore et al.	
	AL1	2003/0137869	07/24/2003	Kozicki	
	AM1	2003/0143782	07/31/2003	Gilton et al.	
	AN1	2003/0155589	08/21/2003	Campbell et al.	
	AO1	2003/0155606	08/21/2003	Campbell et al.	
	AP1	2003/0156447	08/21/2003	Kozicki	
	AQ1	2003/0156463	08/21/2003	Casper et al.	
New		2003/0209728	11/13/2003	Kozicki et al	
New		2003/0209971	11/13/2003	Kozicki et al	
New		2003/0210564	11/13/2003	Kozicki et al	



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				First Named Inventor	Kristy A. Campbell
				Art Unit	N/A
				Examiner Name	Not Yet Assigned
Sheet	2	of	11	Attorney Docket Number	M4065.0724/P724

	AR1	3,622,319	11/1971	Sharp	
	AS1	3,743,847	7/1973	Boland	
	AT1	4,269,935	5/1981	Masters et al.	
	AU1	4,312,938	1/1982	Drexler, et al.	
	AV1	4,316,946	1/1982	Masters, et al.	
	AW1	4,320,191	3/1982	Yoshikawa et al.	
	AX1	4,405,710	9/1983	Balasubramanyam et al.	
	AY1	4,419,421	12/1983	Wichelhaus, et al.	
	AZ1	4,499,557	2/1985	Holmberg et al.	
	AA2	4,671,618	06/09/1987	Wu et al.	
	AB2	4,795,657	1/1989	Formigoni et al.	
	AC2	4,800,526	01/24/1989	Lewis	
	AD2	4,847,674	7/1989	Sliwa et al.	
	AE2	5,177,567	1/1993	Klersy et al.	
	AF2	5,219,788	6/1993	Abernathey et al.	
	AG2	5,238,862	8/1993	Blalock et al.	
	AH2	5,272,359	12/21/1993	Nagasubramanian et al.	
	AI2	5,314,772	5/24/1994	Kozicki	
	AJ2	5,315,131	5/1994	Kishimoto et al.	
	AK2	5,350,484	9/1994	Gardner et al.	
	AL2	5,360,981	11/1994	Owen et al.	
	AM2	5,500,532	3/19/1996	Kozicki et al.	
	AN2	5,512,328	4/1996	Yoshimura et al.	
	AO2	5,512,773	4/1996	Wolf et al.	
	AP2	5,726,083	3/1998	Takaishi	
	AQ2	5,751,012	5/12/1998	Wolstenholme et al.	
	AR2	5,761,115	6/1998	Kozicki et al.	
	AS2	5,789,277	8/1998	Zahorik et al.	
	AT2	5,814,527	9/29/1998	Wolstenholme et al	
	AU2	5,818,749	10/06/1998	Harshfield	
	AV2	5,841,150	11/1998	Gonzalez et al.	
	AW2	5,846,889	12/1998	Harbison et al.	
	AX2	5,851,882	12/22/1998	Harshfield	
	AY2	5,869,843	2/9/1999	Harshfield	
	AZ2	5,896,312	4/20/1999	Kozicki et al.	
	AA3	5,914,893	6/22/1999	Kozicki et al.	
	AB3	5,920,788	7/1999	Reinberg	
	AC3	5,998,066	12/1999	Block et al.	
	AD3	6,031,287	2/29/2000	Harshfield	
	AE3	6,072,716	06/06/2000	Jacobson et al.	
	AF3	6,077,729	6/2000	Harshfield	
	AG3	6,084,796	7/4/2000	Kozicki et al.	
	AH3	6,177,338	1/2001	Liaw et al.	
	AI3	6,117,720	9/2000	Harshfield	
	AJ3	6,143,604	11/2000	Chiang et al.	
	AK3	6,236,059	5/2001	Wolsteinholme et al.	
	AL3	6,297,170	10/2001	Gabriel et al.	
	AM3	6,300,684	10/2001	Gonzalez et al.	
	AN3	6,316,784	11/2001	Zahorik et al.	



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				First Named Inventor	Kristy A. Campbell
				Art Unit	N/A
				Examiner Name	Not Yet Assigned
Sheet	3	of	11	Attorney Docket Number	M4065.0724/P724

	AO3	6,329,606	12/2001	Freyman et al.	
	AP3	6,348,365	2/19/2002	Moore et al.	
	AQ3	6,350,679	2/2002	McDaniel et al.	
	AR3	6,376,284	4/2002	Gonzalez et al.	
	AS3	6,388,324	5/14/2002	Kozicki et al.	
	AT3	6,391,688	5/2002	Gonzalez et al.	
	AU3	6,414,376	7/2002	Thakur et al.	
	AV3	6,418,049	7/9/2002	Kozicki et al.	
	AW3	6,420,725	7/16/2002	Harshfield	
	AX3	6,423,628	7/2002	Li et al.	
	AY3	6,440,837	8/27/2002	Harshfield	
	AZ3	6,469,364	10/2002	Kozicki	
	AA4	6,473,332	10/2002	Ignatiev et al.	
	AB4	6,487,106	11/26/2002	Kozicki	

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T ⁶
		Country Code ³ -Number ⁴ -Kind Code ⁵ (if known)				
	BA	56126916	10/19981	Akira et al.		
	BB	WO 97/48032	12/18/1997	Kozicki et al.		
	BC	WO 99/28914	06/10/1999	Kozicki et al.		
	BD	WO 00/48196	08/17/2000	Kozicki et al.		
	BE	WO 02/21542	03/14/2002	Kozicki et al.		

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		Filing Date	July 31, 2003		
		First Named Inventor	Kristy A. Campbell		
		Group Art Unit	N/A		
		Examiner Name	Not Yet Assigned		
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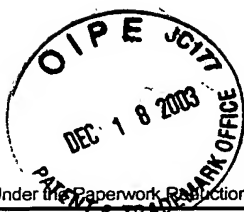
OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
	CA	Abdel-All, A.; Elshafie, A.; Elhawary, M.M., DC electric-field effect in bulk and thin-film Ge ₅ As ₃₈ Te ₅₇ chalcogenide glass, <i>Vacuum</i> 59 (2000) 845-853.	
	CB	Adler, D.; Moss, S.C., Amorphous memories and bistable switches, <i>J. Vac. Sci. Technol.</i> 9 (1972) 1182-1189.	
	CC	Adler, D.; Henisch, H.K.; Mott, S.N., The mechanism of threshold switching in amorphous alloys, <i>Rev. Mod. Phys.</i> 50 (1978) 209-220.	
	CD	Afifi, M.A.; Labib, H.H.; El-Fazary, M.H.; Fadel, M., Electrical and thermal properties of chalcogenide glass system Se ₇₅ Ge ₂₅ -xSbx, <i>Appl. Phys. A</i> 55 (1992) 167-169.	
	CE	Afifi, M.A.; Labib, H.H.; Fouad, S.S.; El-Shazly, A.A., Electrical & thermal conductivity of the amorphous semiconductor GexSe _{1-x} , <i>Egypt, J. Phys.</i> 17 (1986) 335-342.	
	CF	Alekperova, Sh.M.; Gadzhieva, G.S., Current-Voltage characteristics of Ag ₂ Se single crystal near the phase transition, <i>Inorganic Materials</i> 23 (1987) 137-139.	
	CG	Aleksiejunas, A.; Cesnys, A., Switching phenomenon and memory effect in thin-film heterojunction of polycrystalline selenium-silver selenide, <i>Phys. Stat. Sol. (a)</i> 19 (1973) K169-K171.	
	CH	Angell, C.A., Mobile ions in amorphous solids, <i>Annu. Rev. Phys. Chem.</i> 43 (1992) 693-717.	
	CI	Aniya, M., Average electronegativity, medium-range-order, and ionic conductivity in superionic glasses, <i>Solid state Ionics</i> 136-137 (2000) 1085-1089.	
	CJ	Asahara, Y.; Izumitani, T., Voltage controlled switching in Cu-As-Se compositions, <i>J. Non-Cryst. Solids</i> 11 (1972) 97-104.	
	CK	Asokan, S.; Prasad, M.V.N.; Parthasarathy, G.; Gopal, E.S.R., Mechanical and chemical thresholds in IV-VI chalcogenide glasses, <i>Phys. Rev. Lett.</i> 62 (1989) 808-810	
	CL	Axon Technologies Corporation, TECHNOLOGY DESCRIPTION: <i>Programmable Metalization Cell(PMC)</i> , pp. 1-6 (Pre-May 2000).	
	CM	Baranovskii, S.D.; Cordes, H., On the conduction mechanism in ionic glasses, <i>J. Chem. Phys.</i> 111 (1999) 7546-7557.	
	CN	Belin, R.; Taillades, G.; Pradel, A.; Ribes, M., Ion dynamics in superionic chalcogenide glasses: complete conductivity spectra, <i>Solid state Ionics</i> 136-137 (2000) 1025-1029.	
	CO	Belin, R.; Zerouale, A.; Pradel, A.; Ribes, M., Ion dynamics in the argyrodite compound Ag ₇ GeSe ₅ I: non-Arrhenius behavior and complete conductivity spectra, <i>Solid State Ionics</i> 143 (2001) 445-455.	
	CP	Benmore, C.J.; Salmon, P.S., Structure of fast ion conducting and semiconducting glassy chalcogenide alloys, <i>Phys. Rev. Lett.</i> 73 (1994) 264-267.	
	CQ	Bernede, J.C., Influence du metal des electrodes sur les caracteristiques courant-tension des structures M-Ag ₂ Se-M, <i>Thin solid films</i> 70 (1980) L1-L4.	
	CR	Bernede, J.C., Polarized memory switching in MIS thin films, <i>Thin Solid Films</i> 81 (1981) 155-160.	
	CS	Bernede, J.C., Switching and silver movements in Ag ₂ Se thin films, <i>Phys. Stat. Sol. (a)</i> 57 (1980) K101-K104.	
	CT	Bernede, J.C.; Abachi, T., Differential negative resistance in metal/insulator/metal structures with an upper bilayer electrode, <i>Thin solid films</i> 131 (1985) L61-L64.	
	CU	Bernede, J.C.; Conan, A.; Fousenan't, E.; El Bouchairi, B.; Goureaux, G., Polarized memory switching effects in Ag ₂ Se/Se/M thin film sandwiches, <i>Thin solid films</i> 97 (1982) 165-171.	
	CV	Bernede, J.C.; Khelil, A.; Kettaf, M.; Conan, A., Transition from S- to N-type differential negative resistance in Al-Al ₂ O ₃ -Ag ₂ -xSe _{1+x} thin film structures, <i>Phys. Stat. Sol. (a)</i> 74 (1982)	



PTO/SB/08B (10-01)
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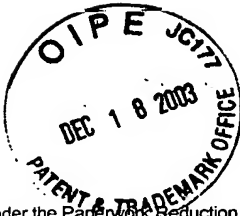
		217-224.	
	CW	Bondarev, V.N.; Pikhitsa, P.V., A dendrite model of current instability in RbAg4I5, Solid State Ionics 70/71 (1994) 72-76.	
	CX	Boolchand, P., The maximum in glass transition temperature (T _g) near x=1/3 in GexSe1-x Glasses, Asian Journal of Physics (2000) 9, 709-72.	
	CY	Boolchand, P.; Bresser, W.J., Mobile silver ions and glass formation in solid electrolytes, Nature 410 (2001) 1070-1073.	
	CZ	Boolchand, P.; Georgiev, D.G.; Goodman, B., Discovery of the Intermediate Phase in Chalcogenide Glasses, J. Optoelectronics and Advanced Materials, 3 (2001), 703	
	CA1	Boolchand, P.; Selvanathan, D.; Wang, Y.; Georgiev, D.G.; Bresser, W.J., Onset of rigidity in steps in chalcogenide glasses, Properties and Applications of Amorphous Materials, M.F. Thorpe and Tichy, L. (eds.) Kluwer Academic Publishers, the Netherlands, 2001, pp. 97-132.	
	CB1	Boolchand, P.; Enzweiler, R.N.; Tenhover, M., Structural ordering of evaporated amorphous chalcogenide alloy films: role of thermal annealing, Diffusion and Defect Data Vol. 53-54 (1987) 415-420.	
	CC1	Boolchand, P.; Grothaus, J.; Bresser, W.J.; Suranyi, P., Structural origin of broken chemical order in a GeSe2 glass, Phys. Rev. B 25 (1982) 2975-2978.	
	CD1	Boolchand, P.; Grothaus, J.; Phillips, J.C., Broken chemical order and phase separation in GexSe1-x glasses, Solid state comm. 45 (1983) 183-185.	
	CE1	Boolchand, P., Bresser, W.J., Compositional trends in glass transition temperature (T _g), network connectivity and nanoscale chemical phase separation in chalcogenides, Dept. of ECECS, Univ. Cincinnati (October 28, 1999) 45221-0030.	
	CF1	Boolchand, P.; Grothaus, J., Molecular Structure of Melt-Quenched GeSe2 and GeS2 glasses compared, Proc. Int. Conf. Phys. Semicond. (Eds. Chadi and Harrison) 17 th (1985) 833-36.	
	CG1	Bresser, W.; Boolchand, P.; Suranyi, P., Rigidity percolation and molecular clustering in network glasses, Phys. Rev. Lett. 56 (1986) 2493-2496.	
	CH1	Bresser, W.J.; Boolchand, P.; Suranyi, P.; de Neufville, J.P., Intrinsically broken chalcogen chemical order in stoichiometric glasses, Journal de Physique 42 (1981) C4-193-C4-196.	
	CI1	Bresser, W.J.; Boolchand, P.; Suranyi, P.; Hernandez, J.G., Molecular phase separation and cluster size in GeSe2 glass, Hyperfine Interactions 27 (1986) 389-392.	
	CJ1	Cahen, D.; Gilet, J.-M.; Schmitz, C.; Chernyak, L.; Gartsman, K.; Jakubowicz, A., Room-Temperature, electric field induced creation of stable devices in CuInSe2 Crystals, Science 258 (1992) 271-274.	
	CK1	Chatterjee, R.; Asokan, S.; Titus, S.S.K., Current-controlled negative-resistance behavior and memory switching in bulk As-Te-Se glasses, J. Phys. D: Appl. Phys. 27 (1994) 2624-2627.	
	CL1	Chen, C.H.; Tai, K.L., Whisker growth induced by Ag photodoping in glassy GexSe1-x films, Appl. Phys. Lett. 37 (1980) 1075-1077.	
	CM1	Chen, G.; Cheng, J., Role of nitrogen in the crystallization of silicon nitride-doped chalcogenide glasses, J. Am. Ceram. Soc. 82 (1999) 2934-2936.	
	CN1	Chen, G.; Cheng, J.; Chen, W., Effect of Si3N4 on chemical durability of chalcogenide glass, J. Non-Cryst. Solids 220 (1997) 249-253.	
	CO1	Cohen, M.H.; Neale, R.G.; Paskin, A., A model for an amorphous semiconductor memory device, J. Non-Cryst. Solids 8-10 (1972) 885-891.	
	CP1	Croitoru, N.; Lazarescu, M.; Popescu, C.; Telnic, M.; and Vescan, L., Ohmic and non-ohmic conduction in some amorphous semiconductors, J. Non-Cryst. Solids 8-10 (1972) 781-786.	
	CQ1	Dalven, R.; Gill, R., Electrical properties of beta-Ag2Te and beta-Ag2Se from 4.2 to 300K, J. Appl. Phys. 38 (1967) 753-756.	
	CR1	Davis, E.A., Semiconductors without form, Search 1 (1970) 152-155.	
	CS1	Dearnaley, G.; Stoneham, A.M.; Morgan, D.V., Electrical phenomena in amorphous oxide films, Rep. Prog. Phys. 33 (1970) 1129-1191.	
	CT1	Dejus, R.J.; Susman, S.; Volin, K.J.; Montague, D.G.; Price, D.L., Structure of Vitreous Ag-Ge-	



PTO/SB/08B (10-01)
 Approved for use through 10/31/2002. OMB 0651-0031
 U. S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
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Sheet	6	of	11	Attorney Docket Number	M4065.0724/P724

	Se, J. Non-Cryst. Solids 143 (1992) 162-180.	
CU1	den Boer, W., Threshold switching in hydrogenated amorphous silicon, Appl. Phys. Lett. 40 (1982) 812-813.	
CV1	Drusedau, T.P.; Panckow, A.N.; Klabunde, F., The hydrogenated amorphous silicon/nanodisperse metal (SIMAL) system-Films of unique electronic properties, J. Non-Cryst. Solids 198-200 (1996) 829-832.	
CW1	El Bouchairi, B.; Bernede, J.C.; Burgaud, P., Properties of Ag ₂ -xSe _{1+x} /n-Si diodes, Thin Solid Films 110 (1983) 107-113.	
CX1	El Gharras, Z.; Bourahla, A.; Vautier, C., Role of photoinduced defects in amorphous GexSe _{1-x} photoconductivity, J. Non-Cryst. Solids 155 (1993) 171-179.	
CY1	El Ghrandi, R.; Calas, J.; Galibert, G.; Averous, M., Silver photodissolution in amorphous chalcogenide thin films, Thin Solid Films 218 (1992) 259-273.	
CZ1	El Ghrandi, R.; Calas, J.; Galibert, G., Ag dissolution kinetics in amorphous GeSe _{5.5} thin films from "in-situ" resistance measurements vs time, Phys. Stat. Sol. (a) 123 (1991) 451-460.	
CA2	El-kady, Y.L., The threshold switching in semiconducting glass Ge ₂₁ Se ₁₇ Te ₆₂ , Indian J. Phys. 70A (1996) 507-516.	
CB2	Elliott, S.R., A unified mechanism for metal photodissolution in amorphous chalcogenide materials, J. Non-Cryst. Solids 130 (1991) 85-97.	
CC2	Elliott, S.R., Photodissolution of metals in chalcogenide glasses: A unified mechanism, J. Non-Cryst. Solids 137-138 (1991) 1031-1034.	
CD2	Elsamanoudy, M.M.; Hegab, N.A.; Fadel, M., Conduction mechanism in the pre-switching state of thin films containing Te As Ge Si, Vacuum 46 (1995) 701-707.	
CE2	El-Zahed, H.; El-Korashy, A., Influence of composition on the electrical and optical properties of Ge ₂₀ BixSe _{80-x} films, Thin Solid Films 376 (2000) 236-240.	
CF2	Fadel, M., Switching phenomenon in evaporated Se-Ge-As thin films of amorphous chalcogenide glass, Vacuum 44 (1993) 851-855.	
CG2	Fadel, M.; El-Shair, H.T., Electrical, thermal and optical properties of Se ₇₅ Ge ₇ Sb ₁₈ , Vacuum 43 (1992) 253-257.	
CH2	Feng, X.; Bresser, W.J.; Boolchand, P., Direct evidence for stiffness threshold in Chalcogenide glasses, Phys. Rev. Lett. 78 (1997) 4422-4425.	
CI2	Feng, X.; Bresser, W.J.; Zhang, M.; Goodman, B.; Boolchand, P., Role of network connectivity on the elastic, plastic and thermal behavior of covalent glasses, J. Non-Cryst. Solids 222 (1997) 137-143.	
CJ2	Fischer-Colbrie, A.; Bienenstock, A.; Fuoss, P.H.; Marcus, M.A., Structure and bonding in photodiffused amorphous Ag-GeSe ₂ thin films, Phys. Rev. B 38 (1988) 12388-12403.	
CK2	Fleury, G.; Hamou, A.; Viger, C.; Vautier, C., Conductivity and crystallization of amorphous selenium, Phys. Stat. Sol. (a) 64 (1981) 311-316.	
CL2	Fritzsche, H., Optical and electrical energy gaps in amorphous semiconductors, J. Non-Cryst. Solids 6 (1971) 49-71.	
CM2	Fritzsche, H., Electronic phenomena in amorphous semiconductors, Annual Review of Materials Science 2 (1972) 697-744.	
CN2	Gates, B.; Wu, Y.; Yin, Y.; Yang, P.; Xia, Y., Single-crystalline nanowires of Ag ₂ Se can be synthesized by templating against nanowires of trigonal Se, J. Am. Chem. Soc. (2001) currently ASAP.	
CO2	Gosain, D.P.; Nakamura, M.; Shimizu, T.; Suzuki, M.; Okano, S., Nonvolatile memory based on reversible phase transition phenomena in telluride glasses, Jap. J. Appl. Phys. 28 (1989) 1013-1018.	
CP2	Guin, J.-P.; Rouxel, T.; Keryvin, V.; Sangleboeuf, J.-C.; Serre, I.; Lucas, J., Indentation creep of Ge-Se chalcogenide glasses below Tg: elastic recovery and non-Newtonian flow, J. Non-Cryst. Solids 298 (2002) 260-269.	
CQ2	Guin, J.-P.; Rouxel, T.; Sangleboeuf, J.-C.; Melscoet, I.; Lucas, J., Hardness, toughness, and	



PTO/SB/08B (10-01)
Approved for use through 10/31/2002. OMB 0651-0031
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Sheet	7	of	11		

		scratchability of germanium-selenium chalcogenide glasses, J. Am. Ceram. Soc. 85 (2002) 1545-52.	
CR2		Gupta, Y.P., On electrical switching and memory effects in amorphous chalcogenides, J. Non-Cryst. Sol. 3 (1970) 148-154.	
CS2		Haberland, D.R.; Stiegler, H., New experiments on the charge-controlled switching effect in amorphous semiconductors, J. Non-Cryst. Solids 8-10 (1972) 408-414.	
CT2		Haifz, M.M.; Ibrahim, M.M.; Dongol, M.; Hammad, F.H., Effect of composition on the structure and electrical properties of As-Se-Cu glasses, J. Apply. Phys. 54 (1983) 1950-1954.	
CU2		Hajto, J.; Rose, M.J.; Osborne, I.S.; Snell, A.J.; Le Comber, P.G.; Owen, A.E., Quantization effects in metal/a-Si:H/metal devices, Int. J. Electronics 73 (1992) 911-913.	
CV2		Hajto, J.; Hu, J.; Snell, A.J.; Turvey, K.; Rose, M., DC and AC measurements on metal/a-Si:H/metal room temperature quantised resistance devices, J. Non-Cryst. Solids 266-269 (2000) 1058-1061.	
CW2		Hajto, J.; McAuley, B.; Snell, A.J.; Owen, A.E., Theory of room temperature quantized resistance effects in metal-a-Si:H-metal thin film structures, J. Non-Cryst. Solids 198-200 (1996) 825-828.	
CX2		Hajto, J.; Owen, A.E.; Snell, A.J.; Le Comber, P.G.; Rose, M.J., Analogue memory and ballistic electron effects in metal-amorphous silicon structures, Phil. Mag. B 63 (1991) 349-369.	
CY2		Hayashi, T.; Ono, Y.; Fukaya, M.; Kan, H., Polarized memory switching in amorphous Se film, Japan. J. Appl. Phys. 13 (1974) 1163-1164.	
CZ2		Hegab, N.A.; Fadel, M.; Sedeek, K., Memory switching phenomena in thin films of chalcogenide semiconductors, Vacuum 45 (1994) 459-462.	
CA3		Helbert et al., <i>Intralevel hybrid resist process with submicron capability</i> , SPIE Vol. 333 SUBMICRON LITHOGRAPHY, pp. 24-29 (1982).	
CB3		Hilt, DISSERTATION: <i>Materials characterization of Silver Chalcogenide Programmable Metalization Cells</i> , Arizona State University, pp. Title page-114 (UMI Company, May 1999).	
CC3		Hirose et al., <i>High Speed Memory Behavior and Reliability of an Amorphous As₂S₃ Film Doped Ag</i> , PHYS. STAT. SOL. (a) 61, pp. 87-90 (1980).	
CD3		Hirose, Y.; Hirose, H., Polarity-dependent memory switching and behavior of Ag dendrite in Ag-photodoped amorphous As ₂ S ₃ films, J. Appl. Phys. 47 (1976) 2767-2772.	
CE3		Holmquist et al., <i>Reaction and Diffusion in Silver-Arsenic Chalcogenide Glass Systems</i> , 62 J. AMER. CERAM. SOC., No. 3-4, pp. 183-188 (March-April 1979).	
CF3		Hong, K.S.; Speyer, R.F., Switching behavior in II-IV-V ₂ amorphous semiconductor systems, J. Non-Cryst. Solids 116 (1990) 191-200.	
CG3		Hosokawa, S., Atomic and electronic structures of glassy GexSe1-x around the stiffness threshold composition, J. Optoelectronics and Advanced Materials 3 (2001) 199-214.	
CH3		Hu, J.; Snell, A.J.; Hajto, J.; Owen, A.E., Constant current forming in Cr/p+a-/Si:H/V thin film devices, J. Non-Cryst. Solids 227-230 (1998) 1187-1191.	
CI3		Hu, J.; Hajto, J.; Snell, A.J.; Owen, A.E.; Rose, M.J., Capacitance anomaly near the metal-non-metal transition in Cr-hydrogenated amorphous Si-V thin-film devices, Phil. Mag. B. 74 (1996) 37-50.	
CJ3		Hu, J.; Snell, A.J.; Hajto, J.; Owen, A.E., Current-induced instability in Cr-p+a-Si:H-V thin film devices, Phil. Mag. B 80 (2000) 29-43.	
CK3		Huggett et al., Development of silver sensitized germanium selenide photoresist by reactive sputter etching in SF ₆ , 42 Appl. Phys. Lett., No. 7, pp. 592-594 (April 1983).	
CL3		Iizima, S.; Sugi, M.; Kikuchi, M.; Tanaka, K., Electrical and thermal properties of semiconducting glasses As-Te-Ge, Solid State Comm. 8 (1970) 153-155.	
CM3		Ishikawa, R.; Kikuchi, M., Photovoltaic study on the photo-enhanced diffusion of Ag in amorphous films of Ge ₂ S ₃ , J. Non-Cryst. Solids 35 & 36 (1980) 1061-1066.	



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PTO/SB/08B (10-01)

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Sheet	8	of	11	Attorney Docket Number	M4065.0724/P724

CN3	Iyetomi, H.; Vashishta, P.; Kalia, R.K., Incipient phase separation in Ag/Ge/Se glasses: clustering of Ag atoms, J. Non-Cryst. Solids 262 (2000) 135-142.
CO3	Jones, G.; Collins, R.A., Switching properties of thin selenium films under pulsed bias, Thin Solid Films 40 (1977) L15-L18.
CP3	Joullie, A.M.; Marucchi, J., On the DC electrical conduction of amorphous As ₂ Se ₇ before switching, Phys. Stat. Sol. (a) 13 (1972) K105-K109.
CQ3	Joullie, A.M.; Marucchi, J., Electrical properties of the amorphous alloy As ₂ Se ₅ , Mat. Res. Bull. 8 (1973) 433-442.
CR3	Kaplan, T.; Adler, D., Electrothermal switching in amorphous semiconductors, J. Non-Cryst. Solids 8-10 (1972) 538-543.
CS3	Kawaguchi et al., Mechanism of photosurface deposition, 164-166 J. NON-CRYST. SOLIDS, pp. 1231-1234 (1993).
CT3	Kawaguchi, T.; Maruno, S.; Elliott, S.R., Optical, electrical, and structural properties of amorphous Ag-Ge-S and Ag-Ge-Se films and comparison of photoinduced and thermally induced phenomena of both systems, J. Appl. Phys. 79 (1996) 9096-9104.
CU3	Kawaguchi, T.; Masui, K., Analysis of change in optical transmission spectra resulting from Ag photodoping in chalcogenide film, Jpn. J. Appl. Phys. 26 (1987) 15-21.
CV3	Kawasaki, M.; Kawamura, J.; Nakamura, Y.; Aniya, M., Ionic conductivity of Ag _x (GeSe ₃) _{1-x} (0<=x<=0.571) glasses, Solid state Ionics 123 (1999) 259-269.
CW3	Kluge, G.; Thomas, A.; Klages, R.; Grotzschel, R., Silver photodiffusion in amorphous GeSe _{100-x} , J. Non-Cryst. Solids 124 (1990) 186-193.
CX3	Kolobov, A.V., On the origin of p-type conductivity in amorphous chalcogenides, J. Non-Cryst. Solids 198-200 (1996) 728-731.
CY3	Kolobov, A.V., Lateral diffusion of silver in vitreous chalcogenide films, J. Non-Cryst. Solids 137-138 (1991) 1027-1030.
CZ3	Kolobov et al., Photodoping of amorphous chalcogenides by metals, Advances in Physics, 1991, Vol. 40, No. 5, pgs. 625-684.
CA4	Korkinova, Ts.N.; Andreichin, R.E., Chalcogenide glass polarization and the type of contacts, J. Non-Cryst. Solids 194 (1996) 256-259.
CB4	Kotkata, M.F.; Afif, M.A.; Labib, H.H.; Hegab, N.A.; Abdel-Aziz, M.M., Memory switching in amorphous GeSeTe chalcogenide semiconductor films, Thin Solid Films 240 (1994) 143-146.
CC4	Kozicki et al., Silver incorporation in thin films of selenium rich Ge-Se glasses, International Congress on Glass, Volume 2, Extended Abstracts, July 2001, pgs. 8-9.
CD4	Michael N. Kozicki, 1. Programmable Metallization Cell Technology Description, February 18, 2000
CE4	Michael N. Kozicki, Axon Technologies Corp. and Arizona State University, Presentation to Micron Technology, Inc., April 6, 2000
CF4	Kozicki et al., Applications of Programmable Resistance Changes In Metal-Doped Chalcogenides, Electrochemical Society Proceedings, Volume 99-13, 1999, pgs. 298-309.
CG4	Kozicki et al., Nanoscale effects in devices based on chalcogenide solid solutions, Superlattices and Microstructures, Vol. 27, No. 516, 2000, pgs. 485-488.
CH4	Kozicki et al., Nanoscale phase separation in Ag-Ge-Se glasses, Microelectronic Engineering 63 (2002) pgs 155-159.
CI4	Lakshminarayan, K.N.; Srivastava, K.K.; Panwar, O.S.; Dumar, A., Amorphous semiconductor devices: memory and switching mechanism, J. Instn Electronics & Telecom. Engrs 27 (1981) 16-19.
CJ4	Lal, M.; Goyal, N., Chemical bond approach to study the memory and threshold switching chalcogenide glasses, Indian Journal of pure & appl. phys. 29 (1991) 303-304.
CK4	Leimer, F.; Stotzel, H.; Kottwitz, A., Isothermal electrical polarisation of amorphous GeSe films with blocking Al contacts influenced by Poole-Frenkel conduction, Phys. Stat. Sol. (a) 29 (1975) K129-K132.

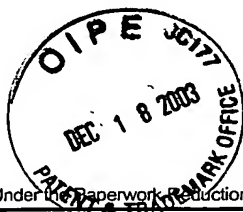


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Sheet	9	of	11		

CL4		Leung, W.; Cheung, N.; Neureuther, A.R., Photoinduced diffusion of Ag in GexSe1-x glass, Appl. Phys. Lett. 46 (1985) 543-545.	
CM4		Matsushita, T.; Yamagami, T.; Okuda, M., Polarized memory effect observed on Se-SnO2 system, Jap. J. Appl. Phys. 11 (1972) 1657-1662.	
CN4		Matsushita, T.; Yamagami, T.; Okuda, M., Polarized memory effect observed on amorphous selenium thin films, Jpn. J. Appl. Phys. 11 (1972) 606.	
CO4		Mazurier, F.; Levy, M.; Souquet, J.L, Reversible and irreversible electrical switching in TeO2-V2O5 based glasses, Journal de Physique IV 2 (1992) C2-185 - C2-188.	
CP4		McHardy et al., The dissolution of metals in amorphous chalcogenides and the effects o electron and ultraviolet radiation, 20 J. Phys. C.: Solid State Phys., pp. 4055-4075 (1987)f	
CQ4		Messoussi, R.; Bernede, J.C.; Benhida, S.; Abachi, T.; Latef, A., Electrical characterization of M/Se structures (M=Ni,Bi), Mat. Chem. And Phys. 28 (1991) 253-258.	
CR4		Mitkova, M.; Boolchand, P., Microscopic origin of the glass forming tendency in chalcogenides and constraint theory, J. Non-Cryst. Solids 240 (1998) 1-21.	
CS4		Mitkova, M.; Kozicki, M.N., Silver incorporation in Ge-Se glasses used in programmable metallization cell devices, J. Non-Cryst. Solids 299-302 (2002) 1023-1027.	
CT4		Mitkova, M.; Wang, Y.; Boolchand, P., Dual chemical role of Ag as an additive in chalcogenide glasses, Phys. Rev. Lett. 83 (1999) 3848-3851.	
CU4		Miyatani, S.-y., Electronic and ionic conduction in (AgxCu1-x)2Se, J. Phys. Soc. Japan 34 (1973) 423-432.	
CV4		Miyatani, S.-y., Electrical properties of Ag2Se, J. Phys. Soc. Japan 13 (1958) 317.	
CW4		Miyatani, S.-y., Ionic conduction in beta-Ag2Te and beta-Ag2Se, Journal Phys. Soc. Japan 14 (1959) 996-1002.	
CX4		Mott, N.F., Conduction in glasses containing transition metal ions, J. Non-Cryst. Solids 1 (1968) 1-17.	
CY4		Nakayama, K.; Kitagawa, T.; Ohmura, M.; Suzuki, M., Nonvolatile memory based on phase transitions in chalcogenide thin films, Jpn. J. Appl. Phys. 32 (1993) 564-569.	
CZ4		Nakayama, K.; Kojima, K.; Hayakawa, F.; Imai, Y.; Kitagawa, A.; Suzuki, M., Submicron nonvolatile memory cell based on reversible phase transition in chalcogenide glasses, Jpn. J. Appl. Phys. 39 (2000) 6157-6161.	
CA5		Nang, T.T.; Okuda, M.; Matsushita, T.; Yokota, S.; Suzuki, A., Electrical and optical parameters of GexSe1-x amorphous thin films, Jap. J. App. Phys. 15 (1976) 849-853.	
CB5		Narayanan, R.A.; Asokan, S.; Kumar, A., Evidence concerning the effect of topology on electrical switching in chalcogenide network glasses, Phys. Rev. B 54 (1996) 4413-4415.	
CC5		Neale, R.G.; Aseltine, J.A., The application of amorphous materials to computer memories, IEEE transactions on electron dev. Ed-20 (1973) 195-209.	
CD5		Ovshinsky S.R.; Fritzsche, H., Reversible structural transformations in amorphous semiconductors for memory and logic, Metallurgical transactions 2 (1971) 641-645.	
CE5		Ovshinsky, S.R., Reversible electrical switching phenomena in disordered structures, Phys. Rev. Lett. 21 (1968) 1450-1453.	
CF5		Owen, A.E.; LeComber, P.G.; Sarraayrouse, G.; Spear, W.E., New amorphous-silicon electrically programmable nonvolatile switching device, IEE Proc. 129 (1982) 51-54	
CG5		Owen, A.E.; Firth, A.P.; Ewen, P.J.S., Photo-induced structural and physico-chemical changes in amorphous chalcogenide semiconductors, Phil. Mag. B 52 (1985) 347-362.	
CH5		Owen, A.E.; Le Comber, P.G.; Hajto, J.; Rose, M.J.; Snell, A.J., Switching in amorphous devices, Int. J. Electronics 73 (1992) 897-906.	
CI5		Owen et al., Metal-Chalcogenide Photoresists for High Resolution Lithography and Sub-Micron Structures, Nanostructure Physics and Fabrication, pp. 447-451 (M. Reed ed. 1989).	
CJ5		Pearson, A.D.; Miller, C.E., Filamentary conduction in semiconducting glass diodes, App. Phys. Lett. 14 (1969) 280-282.	
CK5		Pinto, R.; Ramanathan, K.V., Electric field induced memory switching in thin films of the	



PTO/SB/08B (10-01)
Approved for use through 10/31/2002. OMB 0651-0031
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Substitute for form 1449B/PTO <h2 style="text-align: center;">INFORMATION DISCLOSURE STATEMENT BY APPLICANT</h2> <p style="text-align: center;">(use as many sheets as necessary)</p>		Complete if Known	
		Application Number	10/622,482
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		First Named Inventor	Kristy A. Campbell
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		Examiner Name	Not Yet Assigned
		Attorney Docket Number	M4065.0724/P724
Sheet	10	of	11

		chalcogenide system Ge-As-Se, Appl. Phys. Lett. 19 (1971) 221-223.	
	CL5	Popescu, C., The effect of local non-uniformities on thermal switching and high field behavior of structures with chalcogenide glasses, Solid-state electronics 18 (1975) 671-681.	
	CM5	Popescu, C.; Croitoru, N., The contribution of the lateral thermal instability to the switching phenomenon, J. Non-Cryst. Solids 8-10 (1972) 531-537.	
	CN5	Popov, A.I.; Geller, I.KH.; Shemetova, V.K., Memory and threshold switching effects in amorphous selenium, Phys. Stat. Sol. (a) 44 (1977) K71-K73.	
	CO5	Prakash, S.; Asokan, S.; Ghare, D.B., Easily reversible memory switching in Ge-As-Te glasses, J. Phys. D: Appl. Phys. 29 (1996) 2004-2008.	
	CP5	Rahman, S.; Sivarama Sastry, G., Electronic switching in Ge-Bi-Se-Te glasses, Mat. Sci. and Eng. B12 (1992) 219-222.	
	CQ5	Ramesh, K.; Asokan, S.; Sangunni, K.S.; Gopal, E.S.R., Electrical Switching in germanium telluride glasses doped with Cu and Ag, Appl. Phys. A 69 (1999) 421-425.	
	CR5	Rose, M.J.; Hajto, J.; Lecomber, P.G.; Gage, S.M.; Choi, W.K.; Snell, A.J.; Owen, A.E., Amorphous silicon analogue memory devices, J. Non-Cryst. Solids 115 (1989) 168-170.	
	CS5	Rose, M.J.; Snell, A.J.; Lecomber, P.G.; Hajto, J.; Fitzgerald, A.G.; Owen, A.E., Aspects of non-volatility in a -Si:H memory devices, Mat. Res. Soc. Symp. Proc. V 258, 1992, 1075-1080.	
	CT5	Schuoocker, D.; Rieder, G., On the reliability of amorphous chalcogenide switching devices, J. Non-Cryst. Solids 29 (1978) 397-407.	
	CU5	Sharma, A.K.; Singh, B., Electrical conductivity measurements of evaporated selenium films in vacuum, Proc. Indian Natn. Sci. Acad. 46, A, (1980) 362-368.	
	CV5	Sharma, P., Structural, electrical and optical properties of silver selenide films, Ind. J. Of pure and applied phys. 35 (1997) 424-427.	
	CW5	Shimizu et al., The Photo-Erasable Memory Switching Effect of Ag Photo-Doped Chalcogenide Glasses, 46 B. CHEM SOC. JAPAN, No. 12, pp. 3662-3365 (1973).	
	CX5	Snell, A.J.; Lecomber, P.G.; Hajto, J.; Rose, M.J.; Owen, A.E.; Osborne, I.L., Analogue memory effects in metal/a-Si:H/metal memory devices, J. Non-Cryst. Solids 137-138 (1991) 1257-1262.	
	CY5	Snell, A.J.; Hajto, J.; Rose, M.J.; Osborne, L.S.; Holmes, A.; Owen, A.E.; Gibson, R.A.G., Analogue memory effects in metal/a-Si:H/metal thin film structures, Mat. Res. Soc. Symp. Proc. V 297, 1993, 1017-1021.	
	CZ5	Steventon, A.G., Microfilaments in amorphous chalcogenide memory devices, J. Phys. D: Appl. Phys. 8 (1975) L120-L122.	
	CA6	Steventon, A.G., The switching mechanisms in amorphous chalcogenide memory devices, J. Non-Cryst. Solids 21 (1976) 319-329.	
	CB6	Stocker, H.J., Bulk and thin film switching and memory effects in semiconducting chalcogenide glasses, App. Phys. Lett. 15 (1969) 55-57.	
	CC6	Tanaka, K., Ionic and mixed conductions in Ag photodoping process, Mod. Phys. Lett B 4 (1990) 1373-1377.	
	CD6	Tanaka, K.; Iizima, S.; Sugi, M.; Okada, Y.; Kikuchi, M., Thermal effects on switching phenomenon in chalcogenide amorphous semiconductors, Solid State Comm. 8 (1970) 387-389.	
	CE6	Thornburg, D.D., Memory switching in a Type I amorphous chalcogenide, J. Elect. Mat. 2 (1973) 3-15.	
	CF6	Thornburg, D.D., Memory switching in amorphous arsenic triselenide, J. Non-Cryst. Solids 11 (1972) 113-120.	
	CG6	Thornburg, D.D.; White, R.M., Electric field enhanced phase separation and memory switching in amorphous arsenic triselenide, Journal(?) (1972) 4609-4612.	
	CH6	Tichy, L.; Ticha, H., Remark on the glass-forming ability in GexSe1-x and AsxSe1-x systems, J. Non-Cryst. Solids 261 (2000) 277-281.	
	CI6	Titus, S.S.K.; Chatterjee, R.; Asokan, S., Electrical switching and short-range order in As-Te	



PTO/SB/08B (10-01)

Approved for use through 10/31/2002. OMB 0651-0031

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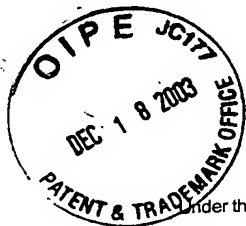
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Sheet	11	of	11	Attorney Docket Number	M4065.0724/P724

		glasses, Phys. Rev. B 48 (1993) 14650-14652.	
	CJ6	Tranchant, S.; Peytavin, S.; Ribes, M.; Flank, A.M.; Dexpert, H.; Lagarde, J.P., Silver chalcogenide glasses Ag-Ge-Se: Ionic conduction and exafs structural investigation, Transport-structure relations in fast ion and mixed conductors Proceedings of the 6th Riso International symposium. 9-13 September 1985.	
	CK5	Tregouet, Y.; Bernede, J.C., Silver movements in Ag ₂ Te thin films: switching and memory effects, Thin Solid Films 57 (1979) 49-54.	
	CL5	Uemura, O.; Kameda, Y.; Kokai, S.; Satow, T., Thermally induced crystallization of amorphous Ge _{0.4} Se _{0.6} , J. Non-Cryst. Solids 117-118 (1990) 219-221.	
	CM6	Uttecht, R.; Stevenson, H.; Sie, C.H.; Griener, J.D.; Raghavan, K.S., Electric field induced filament formation in As-Te-Ge glass, J. Non-Cryst. Solids 2 (1970) 358-370.	
	CIN	Viger, C.; Lefrancois, G.; Fleury, G., Anomalous behaviour of amorphous selenium films, J. Non-Cryst. Solids 33 (1976) 267-272.	
	CO6	Vodenicharov, C.; Parvanov, S.; Petkov, P., Electrode-limited currents in the thin-film M-GeSe-M system, Mat. Chem. And Phys. 21 (1989) 447-454.	
	CP6	Wang, S.-J.; Misium, G.R.; Camp, J.C.; Chen, K.-L.; Tigelaar, H.L., High-performance Metal/silicide antifuse, IEEE electron dev. Lett. 13 (1992) 471-472.	
	CQ6	Weirauch, D.F., Threshold switching and thermal filaments in amorphous semiconductors, App. Phys. Lett. 16 (1970) 72-73.	
	CR6	West, W.C.; Sieradzki, K.; Kardynal, B.; Kozicki, M.N., Equivalent circuit modeling of the Ag As _{0.24} S _{0.36} Ag _{0.40} Ag System prepared by photodissolution of Ag, J. Electrochem. Soc. 145 (1998) 2971-2974	
	CS6	West, W.C., Electrically erasable non-volatile memory via electrochemical deposition of multifractal aggregates, Ph.D. Dissertation, ASU 1998	
	CS7	Zhang, M.; Mancini, S.; Bresser, W.; Boolchand, P., Variation of glass transition temperature, T _g , with average coordination number, <m>, in network glasses: evidence of a threshold behavior in the slope dT _g /d<m> at the rigidity percolation threshold (<m>=2.4), J. Non-Cryst. Solids 151 (1992) 149-154.	

Examiner Signature		Date Considered	
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